



FACULTY: ENGINEERING  
SECOND SEMESTER EXAMINATIONS ON 15, 2016  
2015-2016 1st ACADEMIC SESSION

DR. Y. S. N. A. I. R.

COURSE CODE: CVE 304  
COURSE TITLE: HYDROLOGY  
DURATION: 2 HOURS

#### INSTRUCTIONS

1. ATTEMPT FOUR (4) QUESTIONS ONLY  
SEVERE PENALTIES APPLY FOR MISCONDUCT (CHEATING, POSSESSION  
OF UNAUTHORIZED MATERIALS DURING EXAM  
YOU ARE NOT ALLOWED TO BROWSE OR USE OTHER ANY OTHER  
MATERIALS DURING EXAM

ELIZADE UNIVERSITY, ILARA – MOKIN  
FACULTY OF ENGINEERING

FIRST SEMESTER EXAMINATION,  
2015/2016 ACADEMIC SESSION

INSTRUCTIONS: ANSWER FOUR QUESTIONS ONLY

DATE: JULY, 2016

COURSE: CVE 304 - HYDROLOGY

TIME ALLOWED: 2.5 HOURS ONLY

- 1a) With the aid of a diagram, explain the hydrological cycle and differentiate between the following terms:
- (i) Evaporation and Transpiration
  - (ii) Infiltration and Percolation
  - (iii) Catchment, Watershed and Basin
- b) Enumerate the relevance of Hydrology to Civil Engineering.
- 2a) With the aid of diagrams explain the following terms: Aquifer, Confined Aquifer and Unconfined Aquifer.
- b) For the inflow hydrograph shown below, perform the routing through the reservoir reach using the muskingum method assuming  $K = 17.5$  hours and  $X = 0.25$ .  $\Delta t = 11$  hours. From the graph of the discharge against time determine the maximum discharge and the time at which it occurs. Assume Initial Outflow ( $Q$ ) = 100 cfs.

Time (hr)	12	23	34	45	56	67	78	89	100	111
Inflow (cfs)	100	300	680	500	400	310	230	180	100	50

- 3a) With the aid of a diagram, explain the process of Groundwater Recharge and Discharge.
- b) For the grouped data of the annual floods in the river Benue (2005-2016), find the mean, median, and mode. Also determine the coefficients of skew and the coefficient of variation for the flood.

Class Interval (1000m <sup>3</sup> /s)	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	27-30
Frequency	0	17	27	18	18	3	6	4	1	8

- 4a) Define the term Hydrogeology and enumerate areas where groundwater studies can be carried out.
- b) The following are the rain gauge observations during a storm. Construct: (a) mass curve of precipitation, (b) hyetograph

Time since commencement of storm (min)	4.5	11.5	18.5	25.5	32.5	39.5	46.5	53.5	60.5	67.5
Accumulated rainfall (cm)	0.1	0.2	0.8	1.5	1.8	2.0	2.5	2.7	2.9	3.1

- 5a) Explain the term Groundwater Pollution, enumerating importance of groundwater pollution investigation, Remedial measures which can be used to prevent or reduce groundwater pollution and factors determining the choice of remedial measures.
- b) Explain the following Aquifer parameters:
- i) Porosity
  - ii) Specific Yield
  - iii) Hydraulic Conductivity.
  - iv) Steady and Unsteady Flow